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AUTHOR Yaple, Charles; And Others
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ABSTRACT

Designed to take advantage of the spring season, this resource packet on maple products centers upon a field lesson in harvesting and making maple syrup. The resources in this packet include: a narrative on the origins of maple sugar; an illustrated description of "old time maple sugarin'"; suggestions for pre-trip activities (history of maple sugaring, science of maple sugaring, and a fact sheet on maple syrup); the actual lesson plan on maple syrup (includes tree identification, tapping the tree, collecting and storing the syrup, boiling the syrup, making sugar, and using the syrup in recipes); suggestions for post-trip activities (includes lessons on language arts, science and math, and health); a glossary of maple-related terms; a description of how to make a spile from sumac; an illustrated description of how to identify maple trees; a narrative on the sugar maple as New York's state tree; individual narratives with accompanying exercises on the sugar maple, the red maple, and the silver maple; a maple tree crossword puzzle; three pages of maple product recipes; and teacher tips on how to eliminate unforeseen problems. (JC)

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THE MAPLE PRODUCTS:

AN OUTDOOR EDUCATION UNIT

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DEVELOPED AND PRODUCED BY:

The Cortland-Madison BOCES
Outdoor-Environmental Education
Program

Bruce Matthews, Coordinator
Joseph Smith, Intern
Marilyn Murphy
Mark Leonowiz

(Originally developed by
Charles Yaple and Bruce Matthews)

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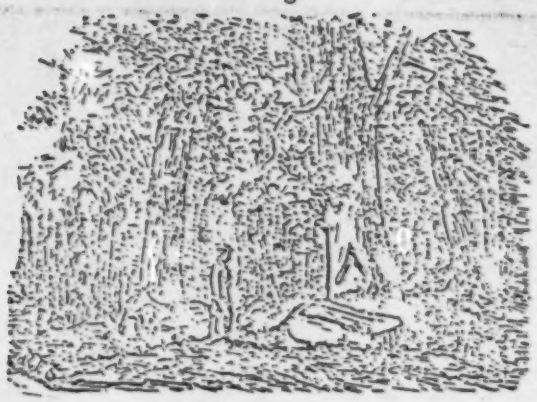
INTRODUCTION

SUGARIN' OFF ! WHAT A MAGICAL TIME OS THE YEAR!

The maple sap flowing is a sure sign that spring is not far behind. Buds are bursting, and once again the annual cycle of life is completed. "The earth has been reborn, and life goes on," As John Denver sings. The kids are itching, the weather is milder, and somehow its just time to go outdoors. SO DON'T FIGHT IT! Maple time provides plenty of good reasons to utilize the outdoors as an educational resource, and in addition, to have fun!

In outdoor education in particular, and education in general, it is of prime importance to utilize every possible teachable moment. That instant of total attention, readiness to learn, motivation, should not be wasted or ignored. In using the outdoors and the attendant bombardment of the senses, many teachable moments will occur. This maple unit is designed to channel these teachable moments into an organized series of learning experiences in order to gain the maximum educational value.

As in our other self-contained outdoor education units, this maple products unit is designed so that each teacher has the resources and outline at their finger tips in order to successfully complete the lesson. Pre trip activities, orientation and post trip lessons are all included. These pre and post activities should be performed in order to ensure maximum learning. As always, the Outdoor Ed staff is willing to assist the teacher with the implementation of this unit.



ORIGINS OF MAPLE SUGAR

"The Indians had a name for it - Sinzibuckwud (drawn from wood) - the Algonquin word for maple sugar. The Ojibways called the maple Ninautik (our own tree), with a preference for the rock maple, Sheesheequmawis (sap flows fast)."

The early Indian method of producing maple syrup and sugar was quite basic. First they gashed the tree with a stone axe. The shape of the gash was of an inverted letter "V". Then they placed a wooden trough at the base of the tree and let the sweet sap flow down the gash and into the trough. Once the sap was collected; it was poured into another trough and heated stones were thrown in to cause the sap to boil. Thus they eventually obtained their sugar. They most often produced maple sugar instead of syrup as it stored more permanently and storage vessels were very scarce among them. When they desired syrup, they simply dissolved some maple sugar in water.

"There is an Iroquois legend about the sap of the maple and how Woksis, the Indian chief, first tasted it as a sweet syrup because he had an ingenious wife. Woksis was going hunting one day early in March. He yanked his tomahawk from the tree where he had hurled it the night before, and went off for the day. The weather turned warm and the gash in the tree, a maple, dripped sap into a vessel that happened to stand close to the trunk. Woksis's squaw, toward evening, needed water in which to boil their dinner. She saw the trough full of sap and thought that would save her a trip to get water. Anyway, she was a careful woman and didn't like to waste anything. She tasted it and found it good-a little sweet, but not bad. So she used it for cooking water. Woksis, when he came home from hunting, scented the inimitable maple aroma, and from far off knew that something especially good was stewing. The water had boiled down to syrup, which sweetened their meal with maple. So, says the legend, was the happy practice inaugurated."

The sugar season was a season of enjoyment for the Indians. They usually remained at their sugar camps until the sap became too acid to make good syrup (when the trees leaves begin to appear). Even today the Minnesota Ojabwa consider the season a holiday. Each female head of a household had her own sugar hut, built in an area abounding in maple trees which was the place used year after year, and claimed by right of descent through her mother's family. The season was so popular that even the braves lent a hand in assisting the squaws in collecting sap. Usually anything besides war and hunting was beneath the dignity of a brave or chief.

"The Indians used the sap of walnuts, hickories, box elders, butternuts, birches, sycamores, and basswood as well as maples. The roughest and crudest way by which they were known to have tapped trees was to break off the ends of the limbs and let the sap from the wounded part drip into a trough or vessel. They would also slash deep gashes in the trees with their tomahawks and set some rude container underneath for the sap. As trees were plentiful and seemingly endless in number, little trouble was taken to spare them."

Maple sap, syrup, and sugar played an important part in the Indian's diet. They considered the sap to have tonic power and in hot weather dissolved the sugar in cold water as a refresher. The squaws cooked their Indian wheat in maple syrup to make a nutty type candy. They also mixed their crushed sugar with ground flour which they took as provisions on all their trips. "This flour keeps well and is very good." Another way they commonly used maple syrup was by putting it in melted bears fat until the fat was almost as sweet as the sugar itself and then dipped their roasted venison in the mixture.

The primitive Indian's diet differed much from our modern eating habits in that many tribes had a distaste for salt and preferred sugar as a flavoring in their food. Salt was not used during meals nor in the cooking or baking process, instead sugar was almost the universal seasoning agent. They were fond of mixing their meat with sweets and even sprinkled sugar or maple syrup over fish boiled in water.

Thus it is well known that Indians were producing and using extensively large amounts of maple products long before the first white settlers arrived on the shores of North America. The early pioneers were quick to adopt many of the Indian methods of producing food. Without the use of Indian techniques to produce food, shelter, and clothing many of our forefathers would have perished in the harsh new world.

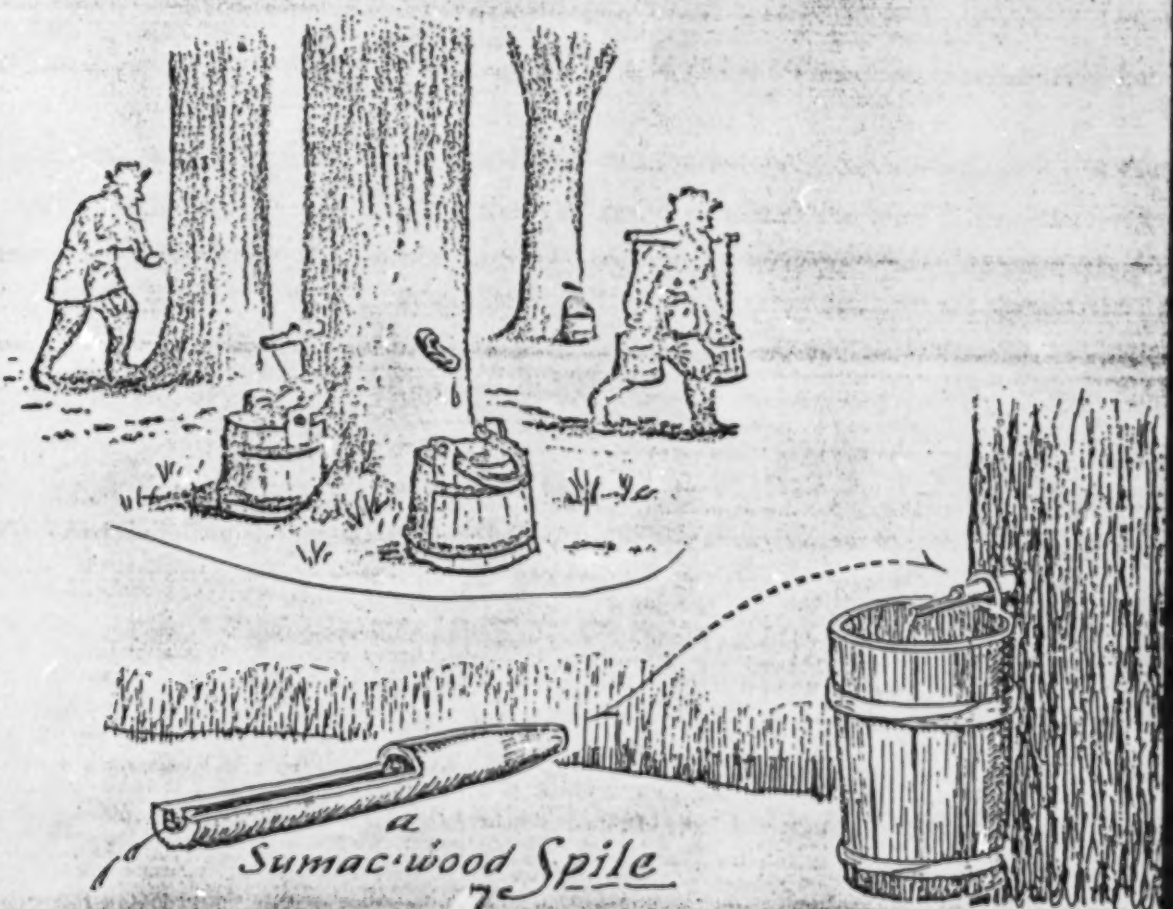
The northern colonists were quick to utilize the maple as a source of sweetening. In fact, many times maple sugar was the only sweetening available to the average early American, due to the prohibitive cost of cane sugar and molasses. Sorghum sugar was the cheapest and was the southern counterpart of the maple. Northern colonists spent sugarin' time helping their neighbors gather sap and boil it down to syrup and sugar.

By the early 1800's the early Americans were operating using basically the same methods we use today, but with different materials. First they would bore a hole in the tree, about four feet from the ground. Then with a wooden mallet they would drive their hollow, wooden spiles (taps) into the tap hole, so that the sap would drip out through the hollow spile and into the wooden bucket placed on the ground below. The sap was collected by boys with yokes and/or big vats on sleds drawn by oxen or mules. When enough had been gathered it was poured into an evaporating pan and boiled, eventually producing syrup and sugar.

Many times the syrup was boiled more and hardened into blocks of sugar weighing up to 10 pounds. The people broke it off as they needed it.

Today the wooden spiles and buckets have been replaced by metal. In many cases the process has been greatly streamlined by using plastic hoses to bring the sap to a central storage vat, thus eliminating much if not all of the gathering process. Bigger, faster-boiling maple syrup arches speed up the whole transition from sap to syrup to sugar.

Perhaps, in the "improvement" to more efficient methods of maple syrup making, something has been lost. By replacing wood with plastic, some of the old time charm of "sugarin' off" just isn't there. While maple syrup making will never reach the point of industrialization, due to the low cost/benefit ratio, the use of certain modern methods may just leave that maple syrup a little less "mapley". However, the waking in the early March morning to hear the snow melt dripping off the eaves will always signify the beginning of sugar time, and the long awaited end of winter.



OLD TIME MAPLE SUGARIN'

The Season for Sugar

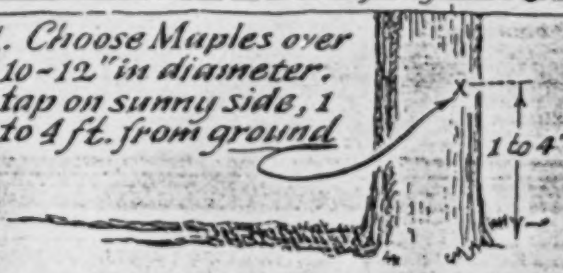
When the heat of the day exactly balances the frost of night.

Day — THAW — 32° to 40°

Night — FREEZE — 32° to 24°

Ground steadily cool.

1. Choose Maples over 10-12" in diameter, tap on sunny side, 1 to 4 ft. from ground



2. Bore slightly upward, using 1/2 inch auger.

3. Tap in Spout, and place Can or Bucket.

Early way, hung on spout; or hung by wire.

4. Collect sap in reservoir

5. Empty into Boiling pan

The Sugar House

Or boil it down (reduced about 12 times) in a cauldron, allow to settle and clarify with milk or white of egg." — JOHN BURROUGHS

SUGGESTED PRE TRIP ACTIVITIES

The following include some activities that will help initiate student interest and involvement in the study of maple sugaring. Student participation in pre trip studies will make the actual educational field trip more meaningful and exciting.

History of Maple Sugaring

1. Use Origins of Maple Sugar sheet
2. Read "The Sugar Snow" chapter from Little House in the Big Woods
3. Show The Maple Sugar Farmer film, (this is obtainable from BOCES on videocassette) An excellent film depicting old time ways of "sugaring" presented in an informative and entertaining manner.

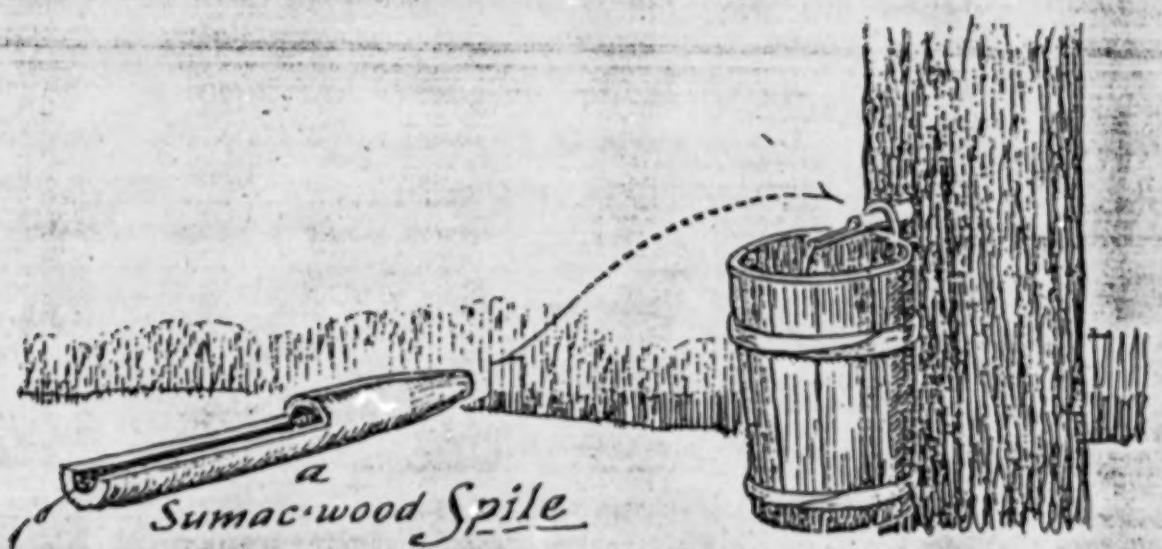
Science of Maple Syruping

1. Use enclosed maple tree sheets to learn about the sugar maple, etc.
2. Discuss the following basic questions:
   - What is sap?
   - What makes it flow during February, March, and April?
   - What are the principles behind boiling sap to make syrup and sugar?
   - Why is the maple sap best during the above months?
3. Study pioneer uses of other trees-ash, beech, oak, cherry, etc.
4. Discuss tree identification.
5. Make spiles from sumac trees.(Directions are in packet)

SUGGESTED PRE-TRIP ACTIVITIES (Con't)

MAPLE FACTS

- It takes an average of 32 to 40 gallons of sap to make one gallon of maple syrup
- The ratio of gallons of sap to syrup depends on the initial percentage of sugar in the sap. Thus if it takes forty gallons of sap to make one gallon of syrup, the sap is a little less than 2% sugar.
- New York state will produce about 300,000 gallons of syrup for commercial sale this season.
- Commercial maple syrup (100% pure New York State) will sell for 10-12 dollars a gallon.
- Maple syrup is graded according to its color. The lighter the syrup the higher the grade. However, darker syrup has a more maple flavor.
- New York state ranks first in pure maple syrup production, with Vermont second and Ohio third. In 1962 New York produced 524,000 gallons of syrup, which was estimated to be worth 2.5 million dollars.
- Tap holes in trees do not damage or hurt the tree, nor do they need to be plugged. A little dead wood at that spot is the result. The next year's tap cannot be made in the same hole, but must be made beside it.
- A tree of 10-14 inches diameter will support one tap, 15-20 inches two taps, 20-25 inches three taps and over 25 inches five taps. 10-15 percent of the tree's sap can be removed without harm.



MAPLE LESSON

This is the actual lesson plan. The boiling of the sap into syrup and sugar can be done on as large a scale as desired. The lesson is designed to trace the process from tapping a tree to eating the resultant syrup. It is an environmental strand approach, designed to illustrate food source concepts (it all doesn't come from the grocery store) on a small scale, and the interrelatedness of living things on a larger scale. It is also guaranteed to leave the class feeling like spring!

I. Tree I.D.(see resource section for assistance)
   a. Show class how to tell difference between maple and other trees.
   b. Find a sugar, red, and silver maple to illustrate differences in bud, shape, tree shape and bark configuration. (This is not mandatory, but sugar maples do produce the best quality syrup.)

II. Tapping
   a. Show how to tap the tree with auger or brace and bit. This does not hurt the tree, if done properly. Tap at a downward angle so sap drains out. Drill a hole of about 2 to 5 inches deep. Be sure and clean out any woodchips.
   b. Drive spile into hole until it fits snugly. Remember that it is going to have to be removed. If tapped on a warm day the sap may flow even as the hole is being drilled. Be sure and taste it!!
   c. Hang buckets beneath the tap. A screen over the bucket will strain out bark, twigs and insects. A wind/rain screen will help insure that drops go in the bucket and sap is not further diluted.

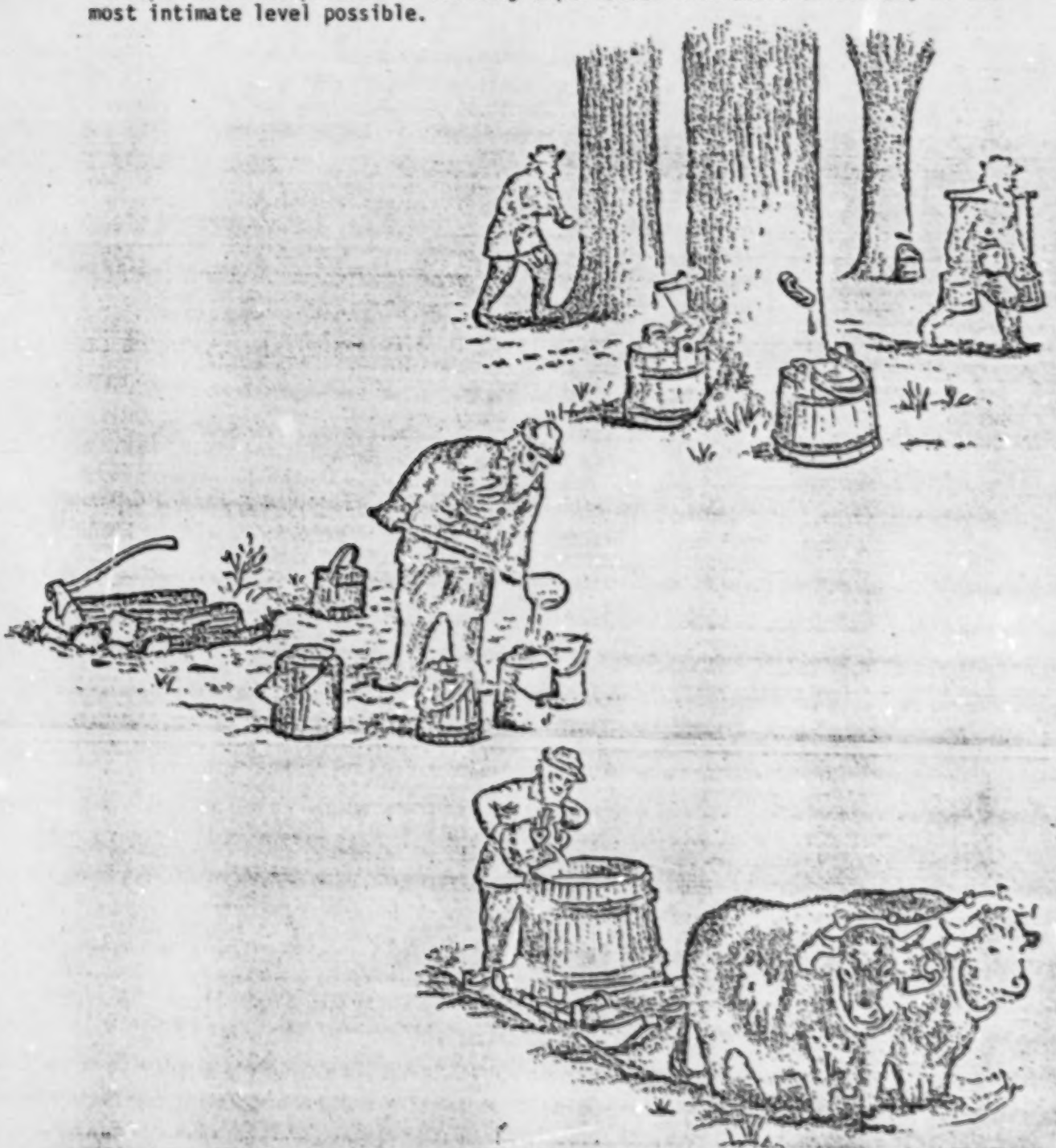
III. Collecting and Storing
   a. The sap should be collected every day it is running in order to preserve its freshness and eliminate bacterial action. If not boiled right away it can be refrigerated and stored. It is not wise to store it longer than a week. Be sure and discuss these considerations with the students.

IV. Boiling
   a. When a sufficient quantity of sap is collected, it can be boiled. Any type of hot plate, stove or fire will do. The larger the amount of sap that can be boiled at once, the faster the production. Add fresh sap as the boiling sap boils down. The liquid will be syrup when the boiling temperature is 7^{o}F. above that of boiling water at present altitude and atmosphere conditions. (A candy thermometer will suffice) See the teacher tips at the end for boiling suggestions. Be sure and discuss the mechanics of this process with the children.
   b. When syrup is made, be sure and have everyone taste it!

V. Sugar
   a. Consult the bibliography for books on how to make sugar and see the recipe section. When syrup is boiled to 30^{o}F. above the water boiling point, it is considered sugar and should be molded and allowed to harden.

VI. Using the syrup, make some of the simple recipes found in this packet.

This process can be done entirely outdoors, or partly indoors. See the teacher tips section for additional suggestions and considerations. As always, the Outdoor Ed. Staff is willing to make arrangments for visits to maple syrup operations, as well as conduct the lesson on the school site. We do feel that the maple lesson is most effective and best illustrates strand/environmental concepts when the process is directly experienced from start to finish, at the most intimate level possible.



SOME SUGGESTED POST TRIP ACTIVITIES

The following activities could be used to sum up the essence of your maple sugar studies. They are designed to reinforce the concepts learned. The post trip studies are an integral part of any Outdoor Ed activity, and should be considered as essential as the lesson itself.

I. Language Arts

A. Write poetry about:
1. "Sugaring" time
2. Boiling sap
3. Tasting maple sugar
4. Syrup on pancakes

B. Write short stories about:
1. "Being a drop of sap" ---- trace its journey to maple syrup or sugar
2. What maple trees feel as they wake up in the spring
3. How maple syrup was discovered. Create Indian legends or pioneer stories.
4. "Saps' A Runnin'"

(Remember: Good creative writing will be published in "Nature News" if submitted)

II. Science and Math

A. Collect and boil some sap in class (Be careful, it can be messy)
B. Make some maple sugar (Bring in maple syrup and boil it down)
C. Calculate gallons of sap to make a unit of syrup
D. Calculate gallons of sap to make a unit of sugar
E. Work with ratios (Sap to Syrup, sap to sugar)

III. Health - study sugars

A. Is all sugar the same?
B. What is sucrose, dextrose, glucose, and fructose

MAPLE GLOSSARY

SPILE - Tap or spout inserted in tree to extract sap.

HYDROMETER- glass tube weighted at the bottom which tells the density of the maple liquid. The hydrometer indicates when the syrup is ready.

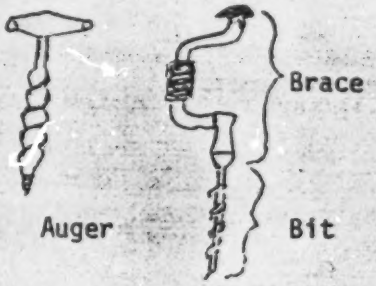
ARCH - Furnace or stove used for boiling sap.

LEATHER APRON, JACK WAX, SUGAR SNOW - Hot maple syrup poured over snow, hardens in a candy.

TAP - Extract sap from trees.

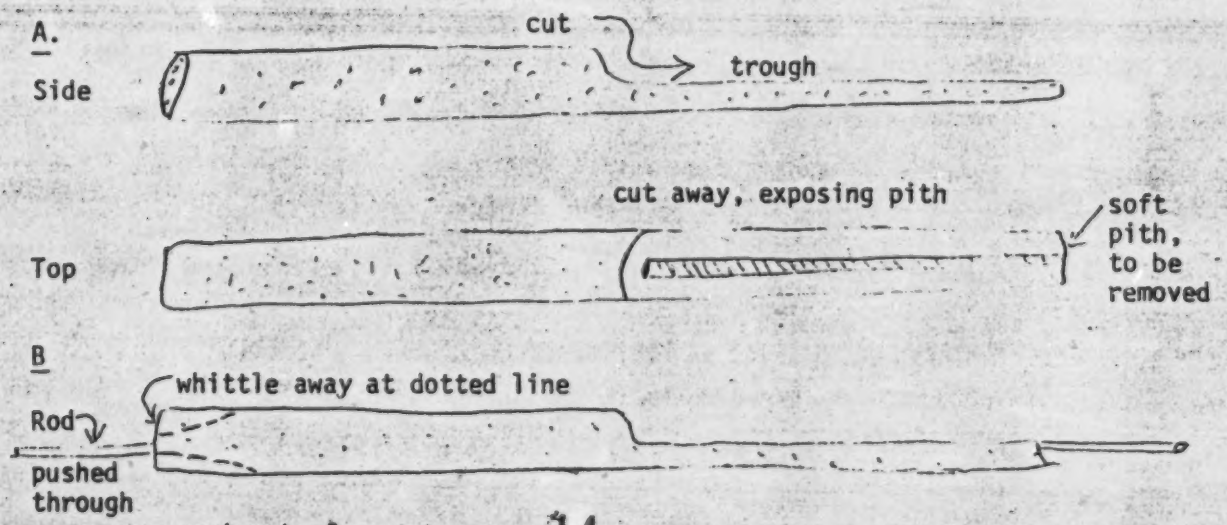
BRACE & BIT-Tool consisting of handle and boring tip.

AUGER - Tool for boring holes in wood.



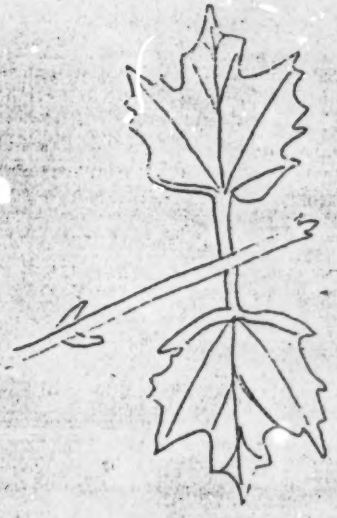
HOW TO MAKE A SPILE FROM SUMAC

1. Cut 1/2 to 3/4 inch diameter branches from the readily available sumac tree. Each spile will be 5-8 inches long. Bark does not need to be removed.
2. Shave half the length, exposing the soft pith, forming a trough through which the sap flows. (See diagram A)
3. Using a coat hanger or other small diameter rod, poke out the pith, forming a tube and trough effect. (See diagram B) The rod may be heated to speed the process, but be careful!
4. Whittle down the tube end so that it will fit tightly in the 7/16 to 1/2 inch tap hole.



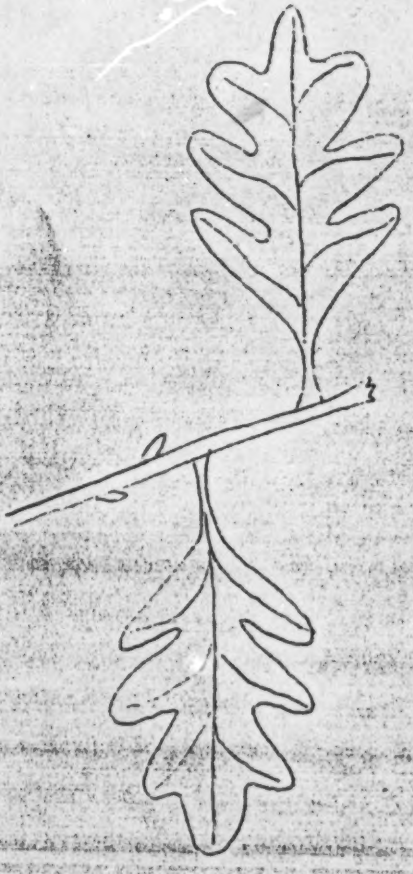
HOW TO TELL THE MAPLES

Maples are our only trees with opposite, fan lobed (five lobes) leaves. That is, the leaves are arranged on the branch opposite each other instead of alternating (see below). The tree's twigs and buds are also opposite.



SUGAR MAPLE

OPPOSITE



WHITE OAK

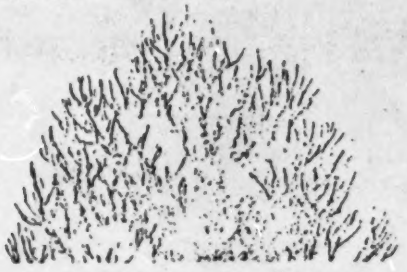
ALTERNATE

The native maples are of great value for shade, ornament, lumber and sugar. Porcupines sometimes eat the inner bark, and the twigs are a staple food of the cottontail rabbit, snowshoe hare, whitetail deer, and moose.

The attached materials will enable you to become an expert on identifying the sugar, red, and silver maple.

INFORMATION LEAFLET
N. Y. STATE CONSERVATION DEPT.
DIVISION OF CONSERVATION EDUCATION

This material from the Department's official magazine —
THE N. Y. STATE CONSERVATIONIST



Our State Tree — the Sugar Maple

by E. H. Huber, Senior Forester, N. Y. S. Conservation Dept.

WHILE New York is frequently referred to as "the State that has everything," and is conceded to be a leader in most fields, including the size of its annual budget, it was one of the "tag enders" when it came to officially designating its State tree. Not until 1956 was a bill drafted and enacted as Section 76 of the State law, making the Sugar Maple *(Acer saccharum M.)* the official State tree. Prior to that date, the only effort made toward selecting a tree for this honor was an unofficial vote of school children in the State taken back in 1893. They favored the sugar maple.

Now that it's official, the selection can hardly be disputed. True, we have some magnificent stands of white pine in New York and this species has been an important contributor to the forest economy of the State, but it falls far short of the sugar maple on most counts.

Depending either on the product, the manufacturer, or the consumer, one of a number of common names are used when referring to this species. *Acer saccharum*. These may vary from the term "hard maple" used by the bowling pin, heel stock and flooring manufacturers, to "rock maple" of the furniture makers and quite naturally to "sugar maple" by syrup producers. As with the rose (our State flower), our State tree is still an all-round, near-perfect specimen, and its sap would be as sweet. Let's just list some of its attributes to make our point. First of all, it is an excellent shade tree, relatively fast-growing, long-lived (over 200 years), compact and dense-crowned, full-leaved and golden-colored in the fall, sometimes with crimson trim. In the woods the tree is looked upon with favor by the forester because of its ability to grow in strong competition with other species, and its economic value in the wood-using industries. The largest specimen ever reported in the State was located near Cooperstown and measured 17′ circumference at 4½ feet above the ground at the time of last state-wide survey of big trees in 1941. Incidentally, then only 6″ less than the national champion found in West Virginia. The annual cut of sugar maple, some 170 million board feet, exceeds 22 per cent of the total sawtimber harvested in New York; this figure is more than double that of any of the other hardwoods cut.

What is all this maple being used for? Well, the bowling boom of the past decade has stepped up the demand for maple to the point that this industry now consumes one-tenth of the total production. Its high specific gravity .56, hardness, sliver-free surface and high impact strength make it ideal for use as alley stock and the manufacture of bowling pins. Another 3/10ths goes to the furniture plants of this and other states. The balance of the annual cut is made into veneer, plywood, toys, rules, pallets, musical instruments, baskets, shoe lasts, heels and a host of miscellaneous items. In addition, sugar maple is one of the preferred species for hardwood pulp because of its high yield; this use now provides a market for the smaller material removed in thinning operations. Although the wood is difficult to work with hand tools, it is easily shaped by power tools and works well on a lathe.

As for syrup production, New York ranked first in 1962 with a whopping 524,000 gallons of syrup as compared to second place Vermont's 367,000 gallons and third ranking Ohio's 114,000 gallons. And, when you realize that on the average, it takes 40 gallons of sap to make one gallon of syrup, that's quite a volume of H_2O to evaporate. The New York crop represented more than 30 per cent of the total U. S. syrup production in 1962 and was conservatively valued at $2½ million.

Perhaps by now you have decided that you would like to have a specimen or two of this decathlon champion of New York trees in your own back yard—not too near the house, please. Remember these maples really grow surprisingly large. Now how do you go about it? Well, *don't write the Conservation Department* for "a sample of our State tree!" Our nurseries are geared to the production of coniferous planting stock, mostly pines and spruces, for reforestation purposes only. Hardwoods—and sugar maple is, of course, a hardwood—have seldom been a success when used for reforestation. Also, we do not grow or distribute any ornamental planting stock and do not wish to be in competition with private nurseries. This leaves you with several alternatives: (1) Dig and transplant a "wildling" (a whip 2′ to 6′ tall); not a difficult procedure assuming you have prior permission from the landowner or, (2) purchase a sizable tree (1″ to 3″ in diameter, 10′ to 15′ tall) to be planted by a nurseryman. Either approach can be successful if reasonable care is exercised. The choice will, of course, depend on several factors such as know-how, tools available, your energy, your finances and the urgency for the shade, long-lasting beauty and enjoyment these trees will provide for your lifetime and then some.

As informed citizens, we should all appreciate and promote the sugar maple and making it our official tree was well-deserved and overdue recognition of its stature in the State.

THE SUGAR MAPLE

The sugar maple is one of our finest trees. It grows tall with a straight trunk. It is called sugar maple because its sap has much sugar in the spring of the year.

Men bore holes into the trunk of this tree, put little spouts into the hole, and the sap will run down and out into buckets. The sap is boiled until it turns into syrup, and by further boiling it until all the water has boiled away, it turns into maple sugar. If a maple tree is bored carefully, it may be tapped every year as long as it lives.

The wood is used for hardwood flooring, for furniture and baskets. It also furnishes some of the best firewood we have. At times the wood of the trunk is bunched up into hard round points which have been called bird's eyes. Bird's eye maple makes beautiful furniture because the knots take a high polish. No one knows how these knots develop.

The bark of the tree is rough and peels off in thick pieces. The tips of the lobes of the leaves are rounded.

The tree grows to a height of eighty feet or more and the trunk may reach a diameter of three feet or over. Like all maples, the sugar maple has opposite leaves and opposite twigs. The buds are brown and very sharp-pointed.

You will not find this maple very often along city streets but it is very common in parks and in upland woods. It prefers to grow in woods which are not too wet nor too dry. Its seedlings can grow even in shade under the forest trees.

The sugar maple grows slowly, but it is a fine tree and not troubled by insects. Its branches do not break easily.

EXERCISE

THE SUGAR MAPLE

Underline the correct word or phrase.

1. The sugar maple is so called because it (likes sugar has a sweet odor has sugar in the flowers has sugar in the sap).
2. The sap is gathered in (spring dark nights winter).
3. Sugar and syrup are made out of the sap by (letting it stand putting it into cans boiling it).
4. Men get the sap from the tree by (cutting it down pressing the leaves boring holes into the trunk).
5. The wood is good for (fences furniture and flooring baskets).
6. The bark is (smooth in thick scales tight-fitting).
7. The sugar maple is most commonly found (along city streets along rivers about homes in parks and upland woods).
8. The tips of the lobes are (sharp-pointed rounded spiny).
9. The tree grows best in soil which is (wet dry not too dry).
10. The seedlings can grow (only in the open in wet land in the shade of the forest).
11. The sugar maple grows (fast slowly medium fast).
12. It is a good tree for city planting because it (makes better shade is not troubled by insects grows well).
13. It may reach a diameter of (one two three more than three) feet.
14. The buds are (round flat sharp-pointed).
15. Bird's eye maple makes fine (bird houses furniture boxes).

Total score: 15

My score: .....

THE SUGAR MAPLE

Leaf: pink or red with yellow lobes

Bud: reddish-brown

Twig: dark-gray

Fruit: pale-green

THE RED MAPLE

The appearance of the red maple is somewhat like that of the silver maple but the two trees can easily be distinguished by their leaves. The middle lobe of the leaf of the red maple is almost square and does not cut to the midrib like a "V." In winter these two maples are hard to tell apart.

The red maple flowers before the leaves appear. The flower buds are round and clustered around the twig. It is one of the first trees to bloom in spring when the season is mild. The pollen is carried by small insects, for bees seldom venture out while winter is still in the air.

The bark is covered with thick scales or low ridges and does not peel off in thin slabs as that of the silver maple. Its branches are not broken so easily by wind and ice as those of the silver maple.

The red maple may become a very tall tree and grow to two feet or more in diameter. It is a regular tramp among the trees for it may be found in all kinds of places, both dry and wet. It grows best in low, wet soil where it may make up whole forests. It is not very common in cities except in northern states.

In the more southern range this tree is not so showy red as in the swampy places of the north. In northern swamps the leaves of the red maple begin to turn red in August and one is reminded that summer will soon be over.

The wood is not of much value except for firewood. It decays readily when it is cut and laid on the ground where it becomes wet and may never dry out well.

EXERCISE

THE RED MAPLE

Some of the statements below are correct and some are incorrect. Place a "C" in front of each statement which is correct and an "O" in front of each one which is incorrect.

1. .....The red maple looks very much like the silver maple.
2. .....You can tell the red maple from the silver maple by the bud.
3. .....You can tell it by the middle lobe of the leaf.
4. .....The middle lobe of the red maple leaf is V-shaped.
5. .....The bark peels off in long, thin slabs.
6. .....It is a common tree in all cities.
7. .....The red maple may become a tall tree.
8. .....The branches break easily.
9. .....It grows best on hills.
10. .....It may grow anywhere.
11. .....It is more common in cities of the south.
12. .....Its branches break as readily as those of the silver maple.
13. .....It never grows very tall.
14. .....The wood is used much for furniture.
15. .....The wood decays readily when in contact with soil.

Total score: 15

My score: .....

THE RED MAPLE

Leaf: red or red with streaks of yellow

Bud: red

Twig: reddish-brown, at times bright red

Fruit: reddish-brown

THE SILVER MAPLE

The silver maple is so called because the underside of the leaf looks silver-gray. This is easily seen when the wind turns the leaves. When the wind blows hard the whole tree may look silvery.

It is a very common tree along our city streets because it grows rapidly and becomes quite a large tree in a few years. While this tree grows rapidly, it is not so good a tree to plant as the Norway maple or the elm. Sometimes it is called soft maple because the wood is not so hard as that of the sugar maple. For this reason the branches break very readily when a storm blows or when the trees are loaded down by sleet. The silver maple is also attacked by a scale, the maple cottony, which causes a sugary fluid to drip from the tree.

The silver maple prefers rich, moist soil. In the country it grows mainly in low, moist ground and along creeks and rivers.

This tree may be easily recognized by its leaves because the middle lobe cuts in towards the midrib like a wedge or a broad "V."

The leaves usually do not turn a very pretty color in autumn; they turn mostly gray to yellow. Now and then a tree may show much red.

The bark of young trees is smooth and gray but in old trees it splits into long thin slabs which peel off readily. The silver maple usually has the tips of the branches drooping and turning up at the ends. This may help to recognize it in winter.

THE SILVER MAPLE

Leaf: yellow and gray

Bud: red

Twig: reddish-brown

Fruit: light yellow-green

EXERCISE

THE SILVER MAPLE

Underline the words which will make the sentence correct.

1. The silver maple is so called because the underside of the leaf is (red silver-gray green).
2. The silver color shows (in winter at night when the wind blows).
3. This maple is planted so much in cities because (it is so pretty it grows so fast it grows best there).
4. It is sometimes called soft maple because (it bends easily it grows in soft ground its wood is not so hard as that of the sugar maple).
5. The middle lobe of the leaf (is square is round is small cuts in towards the midrib).
6. The bark on young trees is (gray white brown).
7. In autumn the leaves turn mostly (red gray brown).
8. The bark (is tight peels off in long slabs falls off in small scales).
9. The silver maple grows best (on hills in lowlands on sand).
10. It is (free of disease attacked by a scale eaten by insects).
11. A better tree to plant is the (Norway maple cottonwood boxelder).
12. The silver maple is not good to plant because (it does not look nice it makes too much shade its branches break easily).

Total score: 12

My score: .....

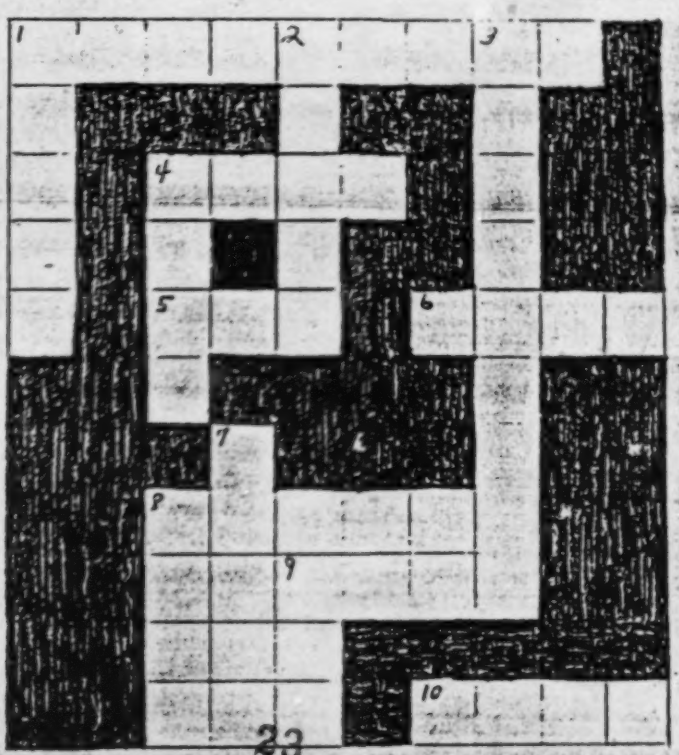
A MAPLE TREE CROSSWORD PUZZLE

ACROSS

1. Walking is made easier in deep snow by wearing _____
4. Tool used to make a hole in the tree for the spout _____
5. Liquid that provides food for the tree _____
6. Piece of wood across the shoulders which helps to carry the heavy sap buckets _____
8. Container that catches the sap dripping from the tree _____
9. Most important part of maple syrup production _____
10. Sap is contained during winter in ground in tree _____

DOWN

1. Tube that sap runs through from tree to bucket _____
2. Maple product put on pancakes _____
3. Process which separates sugar from water by causing water to steam (verb) _____
4. Group of maple trees used for syrup and sugar _____
7. Final solid product after syrup is boiled down _____
8. What is done to the sap to make syrup and sugar (verb) _____
9. To make a hole in the tree for spout _____



Ans. on page 26

MAPLE RECIPES

These are some simple recipes using maple products which you may want to try with your students. Perhaps a party would be in order, with each child or group responsible for a recipe. Happy eating!

† To Make Maple Sugar: *Boil maple syrup until it reaches 242 degrees. Remove from heat and stir until thick. Pour into molds.*

Maple Cup Custards

4 eggs
3 cups milk
¾ cup maple syrup
pinch of salt
¼ tsp. vanilla

Beat eggs slightly, then beat in milk, maple syrup, salt and vanilla. Pour into 8 individual custard cups; set cups in a pan of hot water, and bake in 350 oven for about 45 minutes. Test by inserting knife blade in center: if it comes out clean, the custard is done. Cool before serving.

A beautifully delicate custard, with satiny texture and the wonderful maple flavor.

MAPLE NUT CANDY

Use maple sugar with sufficient water to dissolve it, one tablespoonful of vinegar to 2 pounds of sugar, and butter the size of a walnut. Boil until 260° or hard-ball stage. Pour immediately into buttered pan in which chopped nuts have been placed. Mark in strips before cold.

MAPLE DIVINITY FUDGE

Boil 2 cups maple syrup to 235°. Add a pinch of salt and pour slowly over 2 egg whites that have been beaten stiff. Beat the whole mixture until it holds its shape. Add a third of a cup of chopped nut meats and pour into pan lined with waxed paper. Needs no cooking.

MAPLE NUGGETS

Boil one cup maple syrup (or one cup maple sugar with a few tablespoons of water) until 235°. Remove from fire, add 2 tablespoons butter and beat until it begins to thicken. Add 3 cups puffed rice or wheat which have been crisped over

MAPLE APPLE SAUCE

One cup maple sugar or syrup, with half a cup of water, should be brought to a rolling boil in a deep pan. Then fill pan with unpeeled sections of apples. Stir up until all pieces are coated with syrup. Cook only long enough to tenderize apples. The slices remain unbroken and glazed.

MAPLE NUT COOKIES

Mix altogether in a large bowl 1½ cups maple sugar, 1 cup butter, 3 eggs, 3 cups flour, 1 teaspoon baking powder, 1 teaspoon soda dissolved in half a cup of hot water, 1 cup walnut meats, and 1½ cups dates cut in pieces. Drop from a teaspoon on baking sheet and bake in a moderate oven. Store in a tin can; they improve with age.

Sliced Maple-Peanut Butter Cookies

½ cup crunchy-style peanut butter
½ cup softened shortening
½ cup light brown sugar
½ cup maple syrup
1 egg, to be beaten in
2 cups unsifted flour
½ tsp. baking soda
½ tsp. baking powder
½ tsp. salt

Blend well together the peanut butter and shortening; beat in the brown sugar and maple syrup. Add egg and beat well. Sift flour with baking soda, baking powder and salt. Add to first mixture, beating thoroughly. Turn out on floured board and divide in half. Shape each half into a roll about 2 inches in diameter. Wrap well in waxed paper and chill overnight. Cut in slices about ¼ inch thick and place on an ungreased baking sheet. Bake in 350 oven for about 12 minutes or until light golden brown. Makes about 4 dozen.

† Maple Butter: *Thoroughly blend 1 cup maple syrup with ½ cup softened butter or margarine by beating with a fork. Store in a covered jar in the refrigerator. Use cold as a spread for hot breads; heat in a double boiler for pancake or waffle sauce.*

† Maple Cream: *Cook maple syrup to 232 degrees, remove from heat and cool quickly to room temperature. Then stir until it forms fine granules and becomes thick and creamy, about 20 minutes. This delicacy is superb used as a spread for hot breads.*

Use finely crushed maple sugar instead of white when making cinnamon toast!

Add a little maple syrup to the milk and egg when making French toast: the toast will be a beautiful brown and have unexpected flavor.

Holiday eggnog sweetened with maple syrup is deliciously different.

MAPLE HERMITS

Beat to a cream one-half cup of butter. Gradually beat in ¼ of a cup of maple sugar, ¼ teaspoonful cloves, 1 teaspoonful cinnamon. Dissolve ½ teaspoonful soda in 1 tablespoonful milk, and beat this into the sugar and butter. Add 1 well-beaten egg. Then add 2½ cups flour, ½ teaspoon soda, and 1½ cupful currants. Roll out an inch thick and cut in squares. Bake in a hot oven 12 minutes.

MAPLE PUFFS

Cook 1½ cups maple syrup, 2 pounds maple sugar, 1 cup of water, and a pinch of salt to 260°. Remove from the fire and let stand for 3 or 4 minutes. Then slowly pour in the well-beaten whites of 4 eggs. When thick, stir in 2 cupfuls of walnut meats and drop, in spoonfuls, on heavily waxed paper. Work quickly so that all can be finished before the batch hardens. Needs no cooking.

MAPLE GINGERBREAD

Mix 1 cup maple syrup with 3 tablespoons shortening and 1 teaspoon ginger. Sift and stir in sufficient flour to make the mixture stiff as can be. Then add 1 cup boiling water to which has been added 1 teaspoon soda. Beat well and bake in a quick oven.

Maple-Apple Cobbler

¾ cup maple syrup
½ cup boiling water
1 tsp. vanilla
2 medium apples, peeled and sliced
2 T. softened butter or margarine
½ cup sugar
1½ cups sifted flour
1 tsp. baking powder
¼ tsp. salt
½ cup milk

Combine maple syrup with the water and reheat to boiling; add vanilla and simmer while preparing apples and batter. Arrange apple slices in bottom of buttered, 7-x-10-inch baking pan. Blend sugar with the butter. Sift flour with baking powder and salt and add to sugar mixture, then add milk and mix well. The batter will be thick. Spread it over apple slices and pour the simmering syrup mixture evenly over batter. Bake in 375 oven for about 40 minutes. Serve warm with cream, plain or whipped. Serves 6 to 8.

One of the best of many varieties of cobbler recipes. The syrup and apple slices form a wonderful sauce, covered by a cakelike top.

A favorite drink of the early settlers was made by boiling maple sap down to three-fourths of its original volume, then fermenting it with yeast and flavoring it with spruce twigs.

Fill the hollowed center of an apple with maple syrup and bake it as usual — one of the best of the heavenly maple-apple combinations.

1½ cups whole bran cereal
1 cup buttermilk
¼ cup light brown sugar
¼ cup softened shortening
1 egg, to be beaten in
½ cup maple syrup
1¾ cups sifted flour
½ tsp. salt
1 tsp. baking soda
2/3 cup seedless raisins

Combine bran and buttermilk and let stand 10 minutes. Cream sugar and shortening, beat in the egg, then blend in the maple syrup; stir into the bran mixture. Sift flour with the salt and soda, mix with the raisins, and combine with the bran mixture, stirring only until all ingredients are thoroughly moistened. Bake in greased standard-size bread tin in 375 oven for about 1 hour. Cool thoroughly on wire rack before slicing.

A sweet, well-flavored tea bread, especially good sliced thin and spread with cream cheese.

Old-Fashioned Maple Johnnycake

1 1/3 cups sifted flour
3 tsps. baking powder
½ tsp. salt
2/3 cup yellow cornmeal
2 eggs, beaten
2/3 cup milk
1/3 cup maple syrup
1/3 cup melted shortening

Sift flour with baking powder and salt, then add the cornmeal. Combine eggs, milk, maple syrup and shortening and add to dry ingredients. Stir just enough to mix thoroughly: don't beat. Pour into a greased 9-x-9-inch pan and bake in 400 oven for about 30 minutes. Makes 9 to 12 pieces. Serve piping hot with butter.

Maple Sponge-cake Pudding

½ cup finely crushed maple sugar
½ cup maple syrup
2 T. flour
1 tsp. lemon juice
small pinch of salt
½ tsp. vanilla
3 eggs, separated
2/3 cup undiluted evaporated milk
1/3 cup water
1 T. melted butter or margarine.

Combine first six ingredients. Beat egg yolks until fluffy and add to mixture. Combine milk and water and add; add melted butter. Fold in stiffly beaten egg whites and pour into buttered baking dish. Set dish in pan of hot water and bake in 350 oven for about 50 minutes, or until knife blade comes out clean when inserted in center of pudding. Serve warm or cold. Serves 6.

Light, feathery cake forms on top of the rich maple custard beneath.

"MAPLE SYRUP GOODIES"

MAPLE SUGAR ON SNOW

Boil maple syrup until it forms a soft ball when tested in cold water (or until syrup registers 238 degrees Fahrenheit on candy thermometer). Pour by tablespoon onto a bed of fresh snow, twist sugar from snow on fork. Serve with hot doughnuts, crisp sour pickles and plenty of coffee.

MAPLE SYRUP FROSTING

1 1/4 cups maple syrup
2 egg whites
Pinch of salt

Bring maple syrup to a boil and continue boiling slowly for 45 minutes, until a little dropped in cold water forms a soft ball. Beat egg whites until stiff, adding salt.

Add hot syrup slowly to egg whites, beating constantly until thick.

TEACHER TIPS

As previously noted, this lesson can be conducted on as large or small a scale as desired. This section is designed to offer tips and suggestions for teachers in hopes of eliminating unforseen problems and circumstances, and making the lesson function in the smoothest possible manner.

The pre-trip activities and orientation should serve to pique interest in the lesson. They should be adapted to the specific needs of each individual class by the teacher. In order to ensure maximum involvement and learning in the lesson, some pre-trip activities must occur.

The tree identification is not as essential as other things in the lesson. A bit of pre-trip scouting and keying in the area of the maples to be tapped will insure an adequate knowledge of the trees available. An excellent guide to tree keying in winter can be found in William Harlow's Fruit Key and Twig Key, or his Guide to Trees of the Northeast and Central U.S. and Canada. The maple, especially the sugar maple, has a very distinctive egg shape, with all branches pointing upward. Red maple trees have pointed crowns.

Of course, if tapping is intended, secure the permission of the owner. Only tap a tree if you intend to gather sap during the entire(5-6 week) season. If a shorter experience is desired, and you wish to boil sap with the class, an alternative to tapping your own trees is securing a donation of fresh sap from someone who does tap. Secure enough to make an adequate amount of syrup. 10 gallons will make about a quart.

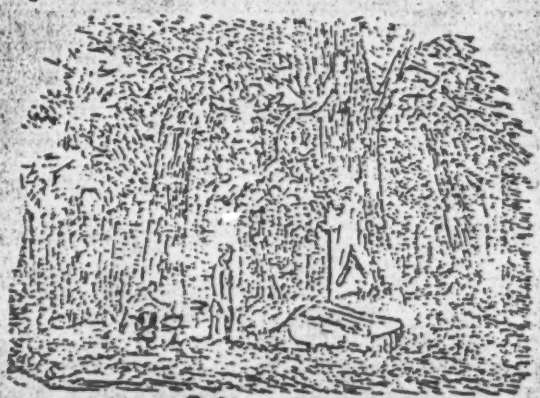
If boiling indoors, be sure to be careful of things affected by steam, such as wallpaper. Boiling sap sends a lot of water in the air. Its also a sticky process so be prepared for this and allow plenty of time for cleanup.

Why not use the maple unit as a kickoff for recreating pioneer times? The maple tree was a central figure in early American cooking and living. Maple time can provide a focal point for expanding interests into pioneer living.

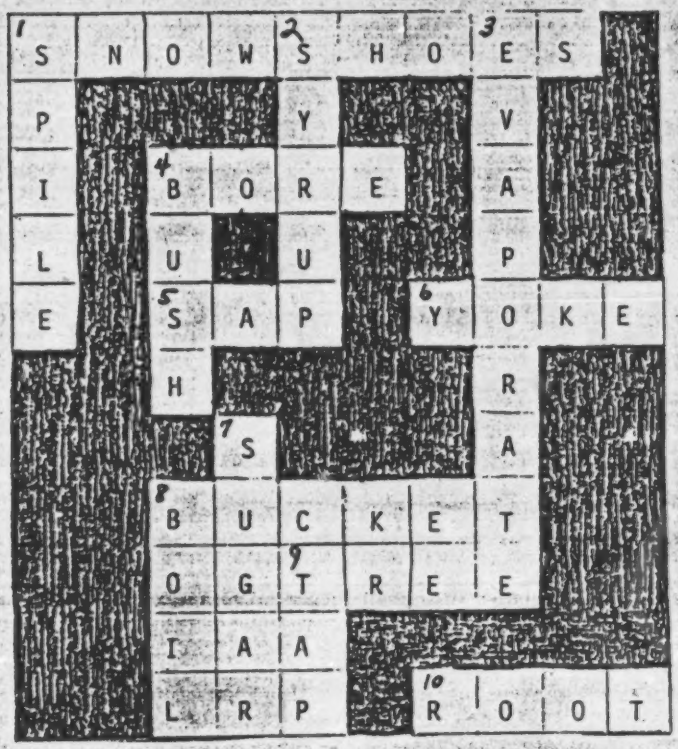
Birch trees, especially yellow and black birch, can also be tapped and boiled into syrup. Birch syrup has a distinctive wintergreen flavor.

In any outdoor setting, children will learn only when they are comfortable. Maple time can be pretty raw and cold. Be sure the students are dressed properly, and take them in if they get cold.

This lesson is most effective when done in sequential order, illustrating the process from start to finish. This strand approach illustrates the interrelatedness of all things, which is vital understanding in this age of compartmentalization.



ANSWERS TO CROSSWORD PUZZLE



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MAPLE FILMS

Indiana - "Collecting the Maple Bonus" 16 mm., 23 min., color, Purdue University, Lafayette, Indiana 47907. Shows modern methods of collecting, evaporating, processing and marketing syrup and maple products.

Minnesota - "Working the Sugarbush" 16 mm., 21 min., color, University of Minnesota, St. Paul, Minnesota 55102. (Filmed in 1958 - somewhat out of date with modern practices.)

"The Story of Maple Syrup Production in Minnesota"- Opens with early Indian methods and contrasts that period with modern practices. Shows cleaning equipment, tapping, collecting, boiling, and bottling.

New Hampshire - "New Hampshire Maple" 16 mm., 22 min., color, sound. Shows the whole maple story. New Hampshire State Library, Park St., Concord, N.H. Dept. of Agriculture; 104 State House Annex, Concord, N.H. 03301.

New York - "The Changing Maple Country" 16 mm., 20 min., color. Rental of $7.50 per day. Shows the whole story. (See address below.)

"Modern Maple Confections" 16 mm., approx. 15 min., color. Rental of $5.00 per day. Processing syrup into sugar products. (See address below.)

Order above from Cornell University, New York State College of Agriculture Film Library, Roberts Hall, Ithaca, New York 14850.

Ohio - "Geauga County Maple Festival" 16 mm., B & W, 10 min. Shows the whole syrup process from tapping to canning at the festival. Write Ture L. Johnson, Service forester, Ohio Dept. of Natural Resources, P.O. Box 373, Burton, Ohio 44021.

Pennsylvania - "Maple Time in Somerset County" 16 mm., 29 min., sound, color. Shows the whole maple story and also the Maple Festival at Meyersdale. Free. Order from Pa. Maple Festival, Box 222, Meyersdale, Pa. 15552.

Vermont - "The Art and Science of Maple Syrup Production" 16 mm., 16 min., sound, color. Shows the whole story. Order from Audio-Visual Aids, University of Vermont, Burlington, Vermont 05401.

"The Flavor of Vermont" 16 mm., 14½ min., sound, color. Shows maple sugaring as part of living in the beautiful countryside of Vermont. Free. Order from the Vermont Public Library Service, Montpelier, Vt. 05602.

"The Maple Story" 16 mm., 15 min., sound, color. Shows the making of maple sugar from the grove to consumer products. Order from Audio Visual Services, University of Vermont, Burlington, Vt. 05401.

"The Miraculous Maple Tree" 16 mm., 28 min., color, sound. Order from Vermont Dept. of Development, Montpelier, Vermont 05602.

Wisconsin - "Maple Syrup" 16 mm., 13 min., color, sound. Made in 1969. Shows the whole maple story. Rent for $2. from Bureau of Audio-Visual Instruction, University of Wisconsin, 1312 W. Johnson St., Madison, Wisconsin 53706. Prints can be purchased for $61. from USDA.

CREDITS

This packet is an expended version of the maple packet developed by Charles Yaple and Bruce Matthews in 1975.

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